

The Role of Educators in Improving The Quality Of Education in The Digital Era at Bandung Private Junior High School (Bandar Setia)

Dinda Aulia Sani & Yusuf Hadijaya

Universitas Islam Negeri Sumatera Utara

Jl. William Iskandar Ps. V, Medan Estate, Kec. Percut Sei Tuan, Kabupaten Deli Serdang, Sumatera Utara

Correspondence: dindaauliasani01@gmail.com

Article received: June 2025, Revision: July 2025, Approval: July 2025

DOI: 10.17977/um025v9i12024p313

Abstract: This study aims to analyze the role of educators in improving the quality of education in the digital era, focusing on a case study at SMP Swasta Bandar Setia. The research highlights three main roles of teachers in digital learning: designing innovative learning, motivating students, and guiding digital literacy and ethics. In addition, this study identifies challenges faced by teachers, including low levels of digital literacy, limited supporting infrastructure, and disparities in technological proficiency between teachers and students. A descriptive qualitative method was employed, with data collected through in-depth interviews, participatory observation, and document analysis. The informants consisted of the principal, vice principal for curriculum, and teachers directly involved in technology-based learning. The findings reveal that teachers at SMP Swasta Bandar Setia have played a strategic role in integrating technology into the learning process, both to enhance student engagement and to shape their character as responsible technology users. Teachers not only utilize technology to support content delivery but also embed digital ethics and critical thinking skills into their lessons. Challenges are addressed through the use of simpler, more accessible technologies, practical digital literacy training, and adaptive teaching strategies aligned with students' characteristics. These findings emphasize that the success of digital education transformation requires synergy between improving teacher competence and providing adequate infrastructure. With the support of integrated school policies, teachers can further optimize their roles in creating relevant, inclusive, and sustainable learning processes in the digital era.

Keywords: Teachers, Education Quality, Digital Era

The implementation of technology in the field of education in Indonesia still faces various complex challenges. The 2022 report from the Ministry of Education, Culture, Research, and Technology indicates a significant digital divide between urban and rural areas. Many schools in remote regions still lack adequate internet access, making it difficult to optimally implement technology-based learning. This condition hampers the equal distribution of education quality in the digital era, which demands fast and unlimited access to information. Digital education requires adequate infrastructure,

both in terms of devices and internet networks(Mwansa, 2025). Without such support, integrating technology into learning will be difficult to implement effectively.

In addition to infrastructure issues, educators also face challenges in developing learning methods suited to the characteristics of the digital era. The traditional teacher-centered learning model is shifting toward collaborative learning that makes intensive use of technology(Smestad et al., 2023). This paradigm shift requires educators to possess sufficient digital competence. Teachers need to master various tools, applications, and innovative learning strategies to utilize technology optimally(Mustafa et al., 2024). This development also changes the role of teachers from merely delivering content to becoming learning facilitators. Teachers' digital competence is a key factor in improving education quality in the digital era.

The needs and characteristics of students in the digital era differ significantly from those of previous generations. Today's students are highly familiar with digital devices and the internet from an early age, making their learning style tend to be interactive and technology-based(Aydin, 2024). This phenomenon presents new challenges for teachers who must adapt to the learning habits of the digital generation. Learning that is monotonous and lacks technology integration tends to be less engaging for students. Therefore, teachers are required to be creative in designing learning experiences that are relevant to the digital world(Luque De La Rosa et al., 2025). Mastery of technology has become a basic necessity rather than an optional skill.

Research by Eristiana, Hamengkubuwono, dan Harmi (2022) shows that online learning presents its own challenges for students. Many students find it difficult to focus on lessons, pay attention to the material, and prepare learning resources independently. External factors such as stable internet connectivity, the availability of data packages, and device ownership are significant barriers(Cabero-Almenara et al., 2021). Meanwhile, teachers also face obstacles in using digital learning applications. Information technology skills, ranging from using laptops to communication apps such as WhatsApp, have become essential requirements. This condition demands teachers' readiness and flexibility in delivering alternative materials tailored to students' needs.

To support online learning, teachers' mastery of technology is a necessity that cannot be postponed. Limited internet access in certain regions is a challenge that must be addressed through policies and support from various stakeholders(Graves et al., 2021). Schools need to provide adequate online learning resources, organize teacher training, and facilitate internet data allocation. Collaboration among teachers, students, and parents is also an important element in the success of learning. Parental involvement in providing facilities and a comfortable study space at home will support the effectiveness of the learning process(Haleem et al., 2022). The roles of family and school must complement each other to ensure the quality of online learning.

The challenges for parents are not only related to the cost of purchasing internet data packages but also to limited knowledge about networks and learning technologies. Many parents are unfamiliar with the online platforms used by schools, limiting their role in guiding their children. Yet, parental

guidance is crucial, especially for junior high school students who still need supervision in managing their study time (Saltos-Rivas et al., 2023); (Montenegro-Rueda & Fernández-Batanero, 2025). Synergy between teachers and parents will help create a conducive learning environment (Sanders & Scanlon, 2021). Open communication between both parties is key to overcoming online learning barriers. Therefore, support from various aspects is essential to achieve educational goals in the digital era.

Based on these conditions, the role of educators in the digital era is becoming increasingly complex and strategic. Teachers are not only responsible for delivering material but also act as mentors, facilitators, and learning innovators (Gisbert Cervera & Caena, 2022). Mastery of digital literacy, media literacy, and advanced technological skills are essential competencies (Nugraeni & Suyatno, 2023); (Wartomo, 2016). Digital literacy has now become a basic skill that determines the success of the learning process. With this competence, teachers can optimize technology to improve the quality of education, especially in private schools such as SMP Swasta Bandung (Bandar Setia). This study aims to analyze the role of educators in improving education quality in the digital era through a case study at the school.

METHOD

This study employed a descriptive qualitative method aimed at providing a systematic, factual, and accurate depiction of phenomena based on in-depth data collection, focusing on understanding the meaning, experiences, and perspectives of the research subjects without manipulation and without prioritizing statistical measurement or generalization (Sugiyono, 2019). Data validity was tested through triangulation by combining the results of direct observation, interviews with relevant stakeholders, and document analysis (Patton, 2002; Bowen, 2009), with the goal of enhancing the validity and credibility of the findings (Miles et al., 2013); (Creswell & Creswell, 2018). The research informants consisted of the Principal who provided information regarding the direction of digital learning policies; the Vice Principal for Curriculum, who explained the implementation of digital mentoring programs, evaluation systems, and teacher training; and teachers as the main informants, who revealed the actual practices of guiding students in digital classrooms, the challenges faced, and the approaches used. Data were collected through field observations, in-depth interviews, and documentation, which included lesson plans (RPP), digitalization learning guidelines, and reports on the implementation of digital literacy programs. Data analysis followed the model of (Miles et al., 2013) which includes the stages of data collection, data reduction, data presentation, and conclusion drawing, ensuring that the research results are presented comprehensively and in depth.

RESULTS AND DISCUSSION

Results

The Role of Educators in Improving the Quality of Education in the Digital Era

The first finding shows that in the implementation of learning technology at SMP Swasta Bandar Setia, teachers have three main roles in improving the quality of education in the digital era, namely: (1) teachers as designers of innovative learning, (2) teachers as motivators, and (3) teachers as inspirers.

Interviews with teachers at SMP Swasta Bandar Setia indicate that the role of teachers as learning designers has undergone significant transformation in the digital era. Teachers are required to develop innovative, interactive, and technology-based learning strategies to suit the characteristics of students who are digital natives.

Teachers at SMP Swasta Bandar Setia explained that in the process of designing learning, they also use technology, creating their own instructional videos, designing engaging visual presentations, and utilizing digital platforms such as Google Forms as evaluation tools. This initiative was carried out in response to the needs of students who prefer visual, concise, and flexibly accessible materials. Teachers also adapt teaching methods to stimulate active student participation, such as by holding online discussion sessions via Google Classroom and Zoom meetings. Teachers are not only required to master the subject matter but also to understand student characteristics, use appropriate technology, and continuously evaluate the effectiveness of their learning designs. Thus, teachers become the key actors in creating adaptive, inclusive, and meaningful digital learning.

Based on research findings at SMP Swasta Bandar Setia, the role of teachers as motivators is highly relevant in the context of digital learning. Teachers not only deliver material but also utilize various technological platforms to enhance student motivation. Platforms such as Google Classroom and other digital media have been used to create an interactive, healthily competitive, and enjoyable learning atmosphere for students. The learning process will succeed if students have intrinsic motivation. Therefore, teachers also play an important role in fostering enthusiasm and motivation in students to learn.

One student at SMP Swasta Bandar Setia expressed a similar sentiment, stating that they feel more motivated to learn when teachers use technology. Teachers who creatively utilize technology are perceived as demonstrating that it can be used positively, not merely for entertainment. This is evident from the increased student participation during online quizzes, with even previously passive students becoming more active in answering and discussing. In addition to fostering enthusiasm for learning, teachers also play an important role in instilling digital ethics in students. Through technology-based learning, teachers incorporate values such as responsibility for shared information, politeness in online communication, and the importance of safeguarding personal account security. This is crucial given that the digital world poses many challenges that are not only technical but also ethical in nature. Teachers at SMP Swasta Bandar Setia stated that their teaching aims to shape students' character as smart and responsible technology users. In the digital era, teachers have an important role as motivators, encouraging students to keep learning while also instilling positive values in technology use. Teaching methods that combine technology with value-based education will make students more motivated to learn while shaping their character to adapt well and behave appropriately in the digital world.

In the era of digital learning, the role of teachers as mentors has become increasingly vital, especially in developing digital literacy and instilling ethical use of technology among students. Interviews with one teacher at SMP Swasta Bandar Setia revealed that many students still lack the

ability to filter appropriate information and do not fully understand digital interaction ethics. This impacts student behavior during online learning, such as using overly informal language, sharing unverified links, or ignoring netiquette in virtual discussion forums. Teachers stated that they not only deliver subject material but also actively guide students in understanding how to communicate and behave in the digital world. One teacher said:

“We always remind students to pay attention to how they comment or send messages in class groups. Some like to abbreviate too many words, or even use emojis that are out of context. We guide them to use more polite and communicative language.”

This finding shows that teachers act as mentors in digital ethics, not only academic guides. In the context of online learning, mentoring in the use of digital media is crucial because students are not only faced with learning materials but also interact within a complex digital ecosystem that is vulnerable to norm deviations. Digital ethics becomes the main foundation to ensure that students are not only technologically capable but also morally sound in their use of technology. Thus, it can be concluded that the role of teachers as mentors in the digital era is essential in guiding students to adapt intelligently and morally to the digital world. This mentorship focuses not only on technical aspects but also on attitudes and values, which will shape students' character in responsible technology use. This is also in line with the principles of the Merdeka Curriculum, which encourages students to become independent and well-charactered individuals. Teachers who can integrate technology into learning in an engaging way will create enjoyable learning experiences that meet the needs of the times. This can also enable students to become not only technology users but also creators of beneficial innovations.

From these three roles, it is evident that teachers at SMP Swasta Bandar Setia have made strategic efforts to drive digital-based educational transformation. The success of learning depends not only on infrastructure or tools but more importantly on the readiness of teachers to integrate technology into the pedagogical process.

Challenges Faced by Educators in Implementing Technology in Learning

The second finding shows that in the implementation of digital learning at SMP Swasta Bandar Setia, there are two main challenges faced by teachers: (1) limited digital literacy and (2) limited supporting facilities and infrastructure. Based on interviews with teachers at SMP Swasta Bandar Setia, it was revealed that the primary challenge in implementing digital learning lies in the readiness and digital competence of teachers, especially those over the age of 45. Most of them still experience difficulties in operating digital devices and using online learning applications. Some even display awkwardness and fear when trying new technologies or applications they are unfamiliar with. This apprehension becomes an initial barrier to integrating technology into classroom learning, particularly during the transition toward a digital-based learning system. Uneven digital literacy among teachers also results in disparities in the ability to manage online learning. Teachers with minimal digital skills tend to face challenges in designing engaging and interactive learning materials. This leads to less

optimal learning processes, as materials are delivered in a monotonous manner and do not match the characteristics of digital learning.

Smith also states that most teachers report low levels of comfort and proficiency in using educational technology. The survey results indicate the importance of continuous professional development programs to enhance teachers' digital literacy. Such training should be more contextual, practical, and aligned with the actual needs of teachers in the field. The challenge of digital literacy is also found among students. Although often referred to as digital natives, many students still lack sufficient digital skills for learning purposes. Some struggle to access e-learning platforms, operate educational software, or follow technical procedures for submitting assignments online. Differences in digital literacy levels affect students' active participation and learning outcomes.

The Vice Principal for Curriculum at SMP Swasta Bandar Setia revealed that one of the main challenges in implementing digital learning is the limited facilities and infrastructure available, both for teachers and the school itself. These constraints directly affect the effectiveness of online or technology-based teaching and learning processes. First, unstable internet connectivity is the main complaint from teachers in conducting digital learning. Teachers reported that on several occasions, the school's internet network often experienced disruptions such as weak signals or disconnections during lessons. This caused interruptions in delivering material, disrupted communication with students, and hindered the smooth flow of learning activities. The same issue is also experienced by students accessing materials from home, especially those living in areas with limited internet access.

Second, there is a shortage of digital classrooms or learning spaces that support technology use. For example, there is a lack of classrooms with strong internet connections and projectors. Some teachers even have to use their personal workspaces with minimal facilities to teach online, which certainly affects the quality of material delivery. Adequate facilities and infrastructure can make teaching easier for teachers and staff and make the learning process more effective and efficient.

Thus, these infrastructure limitations indicate that digital transformation in education requires not only teacher training but also adequate facility and infrastructure support. The unpreparedness of devices and systems will lead to decreased learning quality and technical fatigue for teachers. Therefore, improving digital facilities and investing in educational infrastructure is an urgent step to ensure the successful implementation of technology-based learning in schools.

Solutions for Educators in Improving the Quality of Education in the Digital Era

The third finding indicates that solutions to overcome the challenges of digital learning at SMP Swasta Bandar Setia can be focused on two main aspects that serve as obstacles: (1) improving teachers' competencies in the digital field and (2) providing adequate facilities and infrastructure. Interviews and observations revealed that many teachers still struggle to operate technological devices and digital

learning applications. Some even admitted that they were still unfamiliar with basic tools such as Microsoft Office. One teacher stated:

"I actually want to learn, but sometimes I'm confused about where to start. Especially when the application has so many features, it just feels overwhelming."

This statement reflects the need for more practical and targeted training. To address this challenge, teachers require digital literacy training that is practical and relevant to their everyday classroom situations. Effective training should combine hands-on practice, peer mentoring, and project-based learning. In other words, teachers should not only be given theory but also engaged in teaching simulations using technology so that they can immediately apply it in class. For older teachers or those less familiar with technology-based learning, opportunities should be provided for them to try, make mistakes, and improve with support from tech-savvy colleagues. Several teachers shared in interviews that they feel more comfortable learning informally from peers rather than participating in online training, which sometimes feels overly theoretical. Teachers play an essential role in implementing digital literacy in schools. They should not rely solely on textbooks but also utilize various learning resources such as magazines, newspapers, the internet, and other digital media as learning facilitators. Digital literacy encompasses knowledge and skills in using digital media and communication tools, including the ability to create digital content.

The interviews also revealed that the school's internet connection is often unstable. This disrupts lessons that require online access, such as playing educational videos, using online learning platforms, or searching for materials on the internet. When the internet connection drops in the middle of a lesson, teachers not only lose valuable time but also risk losing students' attention that had been captured by the digital content. In addition to connectivity issues, limited quantity and quality of technological devices are among teachers' main concerns. Some schools only have a few laptops and projectors, which must be shared among many teachers. As a result, not all classes can access technology simultaneously, and device usage must be scheduled. This makes it difficult for teachers to design consistent technology-based lessons. In some cases, the available devices are not in optimal condition, such as slow laptops or projectors with poor image quality.

Moreover, many classrooms in the school still lack adequate technological facilities to support digital learning. Most still use traditional teaching methods without digital aids like projectors or internet access. Consequently, teachers must find ways to incorporate technology themselves, such as bringing their own laptops or using personal mobile data. Unfortunately, this is not feasible for all teachers and cannot be applied in every class. Without sufficient infrastructure, the use of technology in learning will remain sporadic, uneven, and unable to achieve optimal results.

This situation indicates that schools must take a more serious approach to investing in digital infrastructure. This includes providing hardware suited for modern learning needs—such as laptops with adequate specifications, high-speed internet connections, and classrooms equipped with projectors, speakers, and digital boards. Therefore, improving teachers' digital competencies and optimizing facilities and infrastructure are not separate efforts but rather interrelated priorities. Skilled teachers

without proper devices will still face difficulties, and sophisticated devices without competent users will not result in effective learning. Thus, synergy between human resource development and digital infrastructure enhancement should be a priority in digital education strategies at the school level.

DISCUSSION

The Role of Educators in Improving Education Quality in the Digital Era

The findings of this study affirm that teachers at SMP Swasta Bandar Setia play a strategic role in supporting the transformation of education in the digital era through three main roles: innovative learning designers, motivators, and facilitators of digital literacy and ethics. The role of innovative learning designer demonstrates a paradigm shift from conventional methods to adaptive and interactive technology-based learning models (Lilian, 2022); (Aidoo et al., 2024). Strategies such as producing instructional videos, using visual presentations, and utilizing digital platforms for assessment are consistent with the findings of Rusdi et al., (2025) who emphasized that the use of interactive multimedia can enhance student engagement. This indicates that the simultaneous mastery of pedagogical and technological competencies is the key to teachers' success in designing learning that meets the needs of digital-native generations (Ivanov et al., 2025); (Martínez-Moreno & Petko, 2024).

The role of teachers as motivators in digital learning at this school extends beyond improving academic achievement to addressing students' psychological aspects. Teachers employ digital media and applications to create a healthy competitive and enjoyable learning atmosphere, which has been shown to increase participation even among previously passive students. This strategy aligns with the learning motivation theories of Masoumi & Noroozi (2025) dan (Beardsley et al., 2021) which emphasize the importance of external stimuli in fostering students' intrinsic motivation. These findings also correspond with Fardan (2025) research, which highlights the role of teachers in combining educational technology with the inculcation of digital ethics, ensuring that students' learning motivation is directed not only toward cognitive achievement but also toward character formation.

In their capacity as facilitators of digital literacy and ethics, teachers act as the initial filter that helps students discern credible information and understand the norms of online interaction. This approach aligns with Handiyani & Abidin (2023) view that digital literacy encompasses technical, cognitive, and ethical competencies. Teachers at SMP Swasta Bandar Setia not only guide students to verify sources before sharing information but also instill politeness in digital communication. These findings indicate that the success of digital learning greatly depends on the cultivation of students' digital character, ensuring that they become not only technically competent users of technology but also ethical in their behavior.

Factors influencing the success of these teacher roles include adequate digital infrastructure, teachers' openness to innovation, and their willingness to continuously develop professional competencies (Tomczyk, 2024); (Galindo-Domínguez et al., 2024). However, challenges such as disparities in students' digital literacy, limited internet access at home, and varying teacher abilities in

managing digital learning media remain obstacles to be addressed. This reinforces previous findings by UNESCO (2021) that gaps in infrastructure and teachers' digital competence are limiting factors in achieving equitable technology-based education quality.

The findings of this study emphasize that improving education quality in the digital era requires the active involvement of teachers as designers, motivators, and facilitators who can integrate technology with educational values in a holistic manner. This effort is aimed not only at improving academic achievement but also at shaping students' digital character to be critical, ethical, and responsible.

Challenges Faced by Educators in Implementing Technology in Learning

The findings of this study reveal that the main challenges in implementing digital learning at SMP Swasta Bandar Setia include limited digital literacy and inadequate supporting infrastructure. The first factor, limited digital literacy, aligns with the UNESCO (2022) report, which states that the technological skills gap among teachers remains a significant obstacle to the adoption of technology-based learning, particularly for teachers over the age of 45. Interview results indicate that some teachers experience difficulties operating digital devices or online learning applications, and even exhibit awkwardness and apprehension when trying new technologies. This finding is consistent with Howard et al., (2021) who noted that resistance to technological innovation often stems from a lack of confidence and limited hands-on experience with digital tools.

The digital literacy gap among teachers has a direct impact on the quality of online learning design. Teachers with low digital skills tend to deliver lessons using monotonous methods with minimal interactivity, ultimately reducing student engagement. This is consistent with the findings of Zou et al., (2025) dan (Silvy, 2025) who emphasized that teachers' digital competence significantly influences the success of technology-based learning strategies. Furthermore, a survey cited by Yulin & Danso (2025) highlights the need for continuous professional development programs that are practical and contextually relevant so that teachers' digital skills can evolve in line with the demands of the times.

The challenge of digital literacy is not only faced by teachers but also by students (Srivastava & Hagi, 2024). Although often referred to as "digital natives," some students have yet to master the technical skills needed for online learning, such as accessing e-learning platforms, operating educational software, or following technical procedures for online assignment submission. This phenomenon supports the findings of Kirschner & De Bruyckere (2017) who criticized the assumption that all young people automatically possess adequate digital skills for learning. These differences in ability have implications for participation gaps and academic achievement in digital classrooms, making it necessary to adopt differentiated learning approaches that take into account students' varying levels of digital literacy.

The second factor is the lack of facilities and infrastructure, which poses a major obstacle to the effectiveness of digital learning. Unstable internet connectivity, as reported by teachers and the Vice

Principal for Curriculum, disrupts the delivery of learning materials and communication with students. This is consistent with Karimi & Khawaja (2025) who emphasized that the stability of digital infrastructure is a prerequisite for the success of technology-based learning. In addition, the lack of digital classroom facilities—such as the absence of projectors or strong internet access in every learning space—also reduces the quality of learning (Noor, 2021); (Oktafia et al., 2021). Some teachers even have to teach from personal workspaces with limited facilities, which increases their workload and affects the quality of content delivery.

These findings indicate that the success of digital transformation in education cannot be achieved solely by improving teachers' competencies; it also requires adequate investment in infrastructure. The Integrated Digital Education Framework proposed by Barton et al., (2019) emphasizes the importance of balancing human resource readiness, infrastructure availability, and policy support to ensure the sustainability of digital learning. Therefore, improving facilities and infrastructure, providing relevant teacher training, and implementing integrated policy support are strategic steps that must be taken to address these challenges and drive the successful implementation of technology in learning at SMP Swasta Bandar Setia.

Solutions for Educators to Improve the Quality of Education in the Digital Era

The research findings indicate that strategies to enhance technology-based education quality at SMP Swasta Bandar Setia can be directed toward two main approaches: strengthening teachers' digital competencies and providing adequate supporting facilities and infrastructure. The first solution improving teachers' competencies is a priority, considering that low digital literacy remains a major barrier for some educators, particularly those aged over 45. This finding aligns with Alarfaj & Alrashidi (2025) who emphasize that teacher training should be practical, contextual, and designed to allow collaborative learning. Based on interview results, teachers tend to feel more comfortable learning from peers with higher technological proficiency than attending online training sessions that are perceived as overly theoretical. This peer mentoring approach has also proven effective for sustainably enhancing teachers' technological skills (Rasmussen et al., 2016).

Effective digital literacy training should integrate hands-on practice, teaching simulations, and project-based learning. This is in line with the Technological Pedagogical Content Knowledge (TPACK) framework, which underscores the integration of content mastery, pedagogy, and technology (Mishra & Koehler, 2006); (Timotheou et al., 2022). Teachers engaged in direct practice more easily internalize technological skills in real instructional contexts. In schools with teachers of diverse digital backgrounds, tiered training programs with adaptive modules can serve as a solution to accommodate varying learning needs.

The second solution is the optimization of digital learning infrastructure. The availability of adequate hardware—such as high-performance laptops, projectors, digital boards, and high-speed internet connections—is a crucial factor in ensuring the smooth implementation of technology-based

learning. This finding aligns with the OECD (2021) report, which asserts that the quality of a school's digital infrastructure is directly proportional to the effectiveness of online and hybrid learning. Stable internet connectivity not only ensures the continuity of content delivery but also sustains students' motivation to remain engaged in learning (Kampylis & Sala, 2023).

Additionally, providing technology-enabled classrooms can foster instructional innovation. Research by Castaño Muñoz et al., (2023) and (Pedersen et al., 2024) shows that teachers with access to fully equipped digital classrooms are more likely to adopt collaborative and project-based learning methods. However, as found at SMP Swasta Bandar Setia, the limited number of devices often shared in rotation has resulted in inconsistent and sporadic implementation of digital learning. Therefore, investment in digital infrastructure is not merely a technical matter but a long-term strategy to build an inclusive and adaptable learning ecosystem.

The synergy between teacher competence and the availability of facilities and infrastructure is a determining factor in the success of digital education transformation (Falloon, 2020); (Zhao et al., 2021); (Castaño Muñoz et al., 2023). Competent teachers without adequate devices will still face limitations in optimizing technology. Conversely, advanced devices operated by teachers with low digital literacy will not yield a significant impact on learning quality. The Whole-School Approach recommended by UNESCO (2023) emphasizes the need for an integrated strategy combining human resource capacity-building, infrastructure development, and supportive school policies. Thus, improving education quality in the digital era requires strategic, simultaneous, and mutually reinforcing actions between human resources and educational infrastructure.

CONCLUSION AND SUGGESTION

CONCLUSION

Based on the research findings, it is evident that improving the quality of education in the digital era at SMP Swasta Bandar Setia is strongly influenced by three interrelated factors. First, the strategic role of teachers as designers of innovative learning, motivators, and mentors of digital ethics is key to creating adaptive, inclusive, and relevant learning experiences that meet the needs of the digital native generation. Second, various challenges—such as limited digital literacy among teachers and students, as well as inadequate supporting infrastructure—remain significant barriers to the implementation of technology-based learning. Third, effective solutions require synergy between enhancing teachers' digital competencies through practical and contextual training, and providing adequate technological infrastructure to ensure that the learning process can run optimally and sustainably. With the support of integrated school policies, digital education transformation can be realized in an equitable and continuous manner, thereby enabling the quality of education to improve in line with technological advancements.

SUGGESTIONS

Based on the research findings, SMP Swasta Bandar Setia is encouraged to maintain strong collaboration among staff in the implementation of digital learning and to further strengthen the use of learning outcomes in designing more individualized and adaptive teaching strategies. In addition, the school may consider developing a systematic documentation and regular evaluation mechanism for the integration of technology in the learning process, in order to ensure its long-term effectiveness.

REFERENCES

- Aidoo, B., Chebure, A., Gyampoh, A. O., Tsyawo, J., & Quansah, F. (2024). Assessing Student Teachers' Motivation and Learning Strategies in Digital Inquiry-Based Learning. *Education Sciences 2024, Vol. 14, Page 1233, 14(11)*, 1233. <https://doi.org/10.3390/EDUCSCI14111233>
- Alarfaj, A., & Alrashidi, M. (2025). Revolutionizing gifted education: enhancing teachers' digital competence through fourth industrial revolution training. *Discover Sustainability, 6(1)*, 1–23. <https://doi.org/10.1007/S43621-025-00946-Y/TABLES/9>
- Aydin, M. K. (2024). Teachers' digital competences: a scale construction and validation study. *Educational Sciences: Theory & Practice*. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11363428/>
- Barton, E., Bates, E. A., & O'Donovan, R. (2019). "That extra sparkle": students' experiences of volunteering and the impact on satisfaction and employability in higher education. *Journal of Further and Higher ...* <https://doi.org/10.1080/0309877X.2017.1365827>
- Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology, 52(4)*, 1455–1477. <https://doi.org/10.1111/BJET.13101;PAGEGROUP:STRING:PUBLICATION>
- Cabero-Almenara, J., Guillén-Gámez, F. D., Ruiz-Palmero, J., & Palacios-Rodríguez, A. (2021). Digital competence of higher education professor according to DigCompEdu. Statistical research methods with ANOVA between fields of knowledge in different age ranges. *Education and Information Technologies, 26(4)*, 4691. <https://doi.org/10.1007/S10639-021-10476-5>
- Castaño Muñoz, J., Vuorikari, R., Costa, P., Hippe, R., & Kamyplis, P. (2023). Teacher collaboration and students' digital competence - evidence from the SELFIE tool. *European Journal of Teacher Education, 46(3)*, 476–497. <https://doi.org/10.1080/02619768.2021.1938535;JOURNAL:JOURNAL:CETE19;WGROUP:STRING:PUBLICATION>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches Fifth Edition*. SAGE.
- Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development, 68(5)*, 2449–2472. <https://doi.org/10.1007/S11423-020-09767-4/FIGURES/4>
- Fardan. (2025). Peran Guru Akidah Akhlak dalam Menanamkan Nilai-Nilai Etika Digital nilai-nilai etika digital kepada peserta didik . Fokus kajian mencakup strategi pembelajaran. *Akhlak: Jurnal*

Pendidikan Agama Islam Dan Filsafat, 2(3), 247–255.

Galindo-Domínguez, H., Delgado, N., Campo, L., & Losada, D. (2024). Relationship between teachers' digital competence and attitudes towards artificial intelligence in education.

International Journal of Educational Research, 126, 102381.

<https://doi.org/10.1016/J.IJER.2024.102381>

Gisbert Cervera, M., & Caena, F. (2022). Teachers' digital competence for global teacher education.

European Journal of Teacher Education, 45(4), 451–455.

<https://doi.org/10.1080/02619768.2022.2135855>

Graves, J. M., Abshire, D. A., Amiri, S., & Mackelprang, J. L. (2021). Disparities in Technology and Broadband Internet Access across Rurality: Implications for Health and Education. *Family & Community Health*, 44(4), 257. <https://doi.org/10.1097/FCH.0000000000000306>

Family & Community Health, 44(4), 257. <https://doi.org/10.1097/FCH.0000000000000306>

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285.

<https://doi.org/10.1016/J.SUSOC.2022.05.004>

Handiyani, M. H., & Yunus Abidin. (2023). Peran Guru dalam Membina Literasi Digital Peserta Didik pada Konsep Pembelajaran Abad 21. *Jurnal Elementaria Edukasia*, 6(2), 408–414.

<https://doi.org/10.31949/jee.v6i2.5360>

Howard, S. K., Tondeur, J., Ma, J., & Yang, J. (2021). What to teach? Strategies for developing digital competency in preservice teacher training. *Computers and Education*, 165, 104149.

<https://doi.org/10.1016/J.COMPEDU.2021.104149>

Ivanov, A., Radonjić, A., Stošić, L., Krčadinac, O., Đokić, D. B., & Đokić, V. (2025). Teachers' Digital Competencies Before, During, and After the COVID-19 Pandemic. *Sustainability* 2025, Vol. 17, Page 2309, 17(5), 2309. <https://doi.org/10.3390/SU17052309>

<https://doi.org/10.3390/SU17052309>

Kampylis, P., & Sala, A. (2023). Improving the digital capacity of schools by using the SELFIE tool for collective reflection. *European Journal of Education*, 58(2), 331–346.

<https://doi.org/10.1111/EJED.12561>;REQUESTEDJOURNAL:JOURNAL:14653435;CSUBTYPE:STRING:SPECIAL;PAGE:STRING:ARTICLE/CHAPTER

Karimi, H., & Khawaja, S. (2025). Exploring Digital Competence among Higher Education Teachers: A Systematic Review. *International Journal of Learning, Teaching and Educational Research*, 24(1), 298–314. <https://doi.org/10.26803/IJLTER.24.1.15>

<https://doi.org/10.26803/IJLTER.24.1.15>

Kirschner, P. A., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker.

Teaching and Teacher Education, 67, 135–142. <https://doi.org/10.1016/J.TATE.2017.06.001>

Lilian, A. (2022). Motivational beliefs, an important contrivance in elevating digital literacy among university students. *Helicon*, 8(12), e11913. <https://doi.org/10.1016/J.HELIYON.2022.E11913>

<https://doi.org/10.1016/J.HELIYON.2022.E11913>

Luque De La Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025). *Teacher digital competence: Keys for an educational future through a systematic review María de los Ángeles Domínguez-González I* ARTICLE INFO ABSTRACT*. 2025(2), 577. <https://doi.org/10.30935/cedtech/16168>

<https://doi.org/10.30935/cedtech/16168>

- Martínez-Moreno, J., & Petko, D. (2024). Motives for becoming a teacher in times of digital change: Development and validation of the (D)FIT-Choice scale. *Education and Information Technologies*, 29(11), 13221–13245. <https://doi.org/10.1007/S10639-023-12338-8/TABLES/2>
- Masoumi, D., & Noroozi, O. (2025). Developing early career teachers' professional digital competence: a systematic literature review. *European Journal of Teacher Education*, 48(3), 644–666. <https://doi.org/10.1080/02619768.2023.2229006>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative Data Analysis: A Methods Sourcebook*. Sage Publications.
- Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Montenegro-Rueda, M., & Fernández-Batanero, J. M. (2025). Digital Competence: A Challenge for Special Education Teachers. *Exceptionality*. <https://doi.org/10.1080/09362835.2025.2522080;CTYPE:STRING:JOURNAL>
- Mustafa, F., Nguyen, H. T. M., & Gao, X. (Andy). (2024). The challenges and solutions of technology integration in rural schools: A systematic literature review. *International Journal of Educational Research*, 126, 102380. <https://doi.org/10.1016/J.IJER.2024.102380>
- Mwansa, G. (2025). Exploring the challenges and solutions for digital exclusion in rural education. *Heliyon*. <https://doi.org/10.1007/s44282-025-00189-2>
- Noor, T. R. (2021). Strategi Solutif Kepala Sekolah Pada Pembelajaran Daring Selama Pandemi Covid 19 di SDN Sumpat Sidoarjo. *Al-Fikrah: Jurnal Manajemen Pendidikan*, 9(1), 20. <https://doi.org/10.31958/jaf.v9i1.2658>
- Nugraeni, D., & Suyatno, S. (2023). Literasi Digital Guru Dalam Pembelajaran Daring di Sekolah Dasar. *Jurnal Paedagogy*, 10(4), 1034. <https://doi.org/10.33394/jp.v10i4.8846>
- Oktafia, F., Suryana, Y., & Mulyadiprana, A. (2021). Persepsi Kepala Sekolah terhadap Pelaksanaan Pembelajaran Daring di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 3(4), 2118–2124.
- Pedersen, C., Aagaard, T., Daus, S., Nagel, I., Amdam, S. H., Vika, K. S., Røkenes, F. M., & Andreassen, J. K. (2024). Profiling teacher educators' strategies for professional digital competence development. *Teachers and Teaching*, 30(4), 417–436. <https://doi.org/10.1080/13540602.2024.2336612>
- Rasmussen, E. C., White, S. R., King, A. J., Holiday, S., & Densley, R. L. (2016). Predicting Parental Mediation Behaviors: The Direct and Indirect Influence of Parents' Critical Thinking about Media and Attitudes about Parent-Child Interactions. *The Journal of Media Literacy Education*, 8(2), 1–21. <https://doi.org/10.23860/JMLE-2016-08-02-01>
- Rusdi, H., Ervianti, R., Adrias, A., & Zulkarnaini, A. P. (2025). Pengaruh Media Pembelajaran Digital terhadap Motivasi Belajar Siswa Sekolah Dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 10(2), 347–360.

- Saltos-Rivas, R., Novoa-Hernández, P., & Rodríguez, R. S. (2023). Understanding university teachers' digital competencies: a systematic mapping study. *Education and Information Technologies*, 28(12), 16771–16822. <https://doi.org/10.1007/S10639-023-11669-W/METRICS>
- Sanders, C. K., & Scanlon, E. (2021). The Digital Divide Is a Human Rights Issue: Advancing Social Inclusion Through Social Work Advocacy. *Journal of Human Rights and Social Work*, 6(2), 130. <https://doi.org/10.1007/S41134-020-00147-9>
- Silvy. (2025). Peran Literasi Digital dalam Pengembangan Kompetensi Calon Guru Sekolah Dasar. *Hikmah: Jurnal Studi Pendidikan Agama Islam*, 2(2). <https://doi.org/https://doi.org/10.61132/hikmah.v2i2.1092>
- Smestad, B., Hatlevik, O. E., Johannesen, M., & Øgrim, L. (2023). Examining dimensions of teachers' digital competence: A systematic review pre- and during COVID-19. *Heliyon*, 9(6), e16677. <https://doi.org/10.1016/J.HELIYON.2023.E16677>
- Srivastava, R., & Haghi, M. (2024). EMBEDDING WORK-INTEGRATED LEARNING AT UNDERGRADUATE COLLEGE-LEVEL CURRICULUM TO ENHANCE EMPLOYABILITY SKILLS AMONG STUDENTS. *Journal of Teaching English for Specific and Academic Purposes*, 0(0), 729–736. <https://doi.org/10.22190/JTESAP230925054S>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif & RND*. Alfabeta.
- Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2022). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, 28(6), 6695. <https://doi.org/10.1007/S10639-022-11431-8>
- Tomczyk, Ł. (2024). Digital competence among pre-service teachers: A global perspective on curriculum change as viewed by experts from 33 countries. *Evaluation and Program Planning*, 105, 102449. <https://doi.org/10.1016/J.EVALPROGPLAN.2024.102449>
- Wartomo, W. (2016). Peran guru dalam pembelajaran era digital. *Prosiding Temu Ilmiah Nasional Guru*, November, 265–275.
- Yulin, N., & Danso, S. D. (2025). *Assessing Pedagogical Readiness for Digital Innovation: A Mixed-Methods Study*. <https://arxiv.org/pdf/2502.15781>
- Zhao, Y., Pinto Llorente, A. M., & Sánchez Gómez, M. C. (2021). Digital competence in higher education research: A systematic literature review. *Computers & Education*, 168, 104212. <https://doi.org/10.1016/J.COMPEDU.2021.104212>
- Zou, Y., Kuek, F., Feng, W., & Cheng, X. (2025). Digital learning in the 21st century: trends, challenges, and innovations in technology integration. *Frontiers in Education*, 10, 1562391. <https://doi.org/10.3389/FEDUC.2025.1562391/BIBTEX>